Transparent Signal Access and Monitoring

Compatible with Any Data Rate, Any Protocol, Any Format

Communications Service Provider

Optical Transport

Optical Signals

Access Optical Signals

Tapped Signals

De Mux

Distribute To One or Many

International Gateway

Submarine Cable Landing Station

Central Office

Point of Presence (POP)

Monitoring Authority
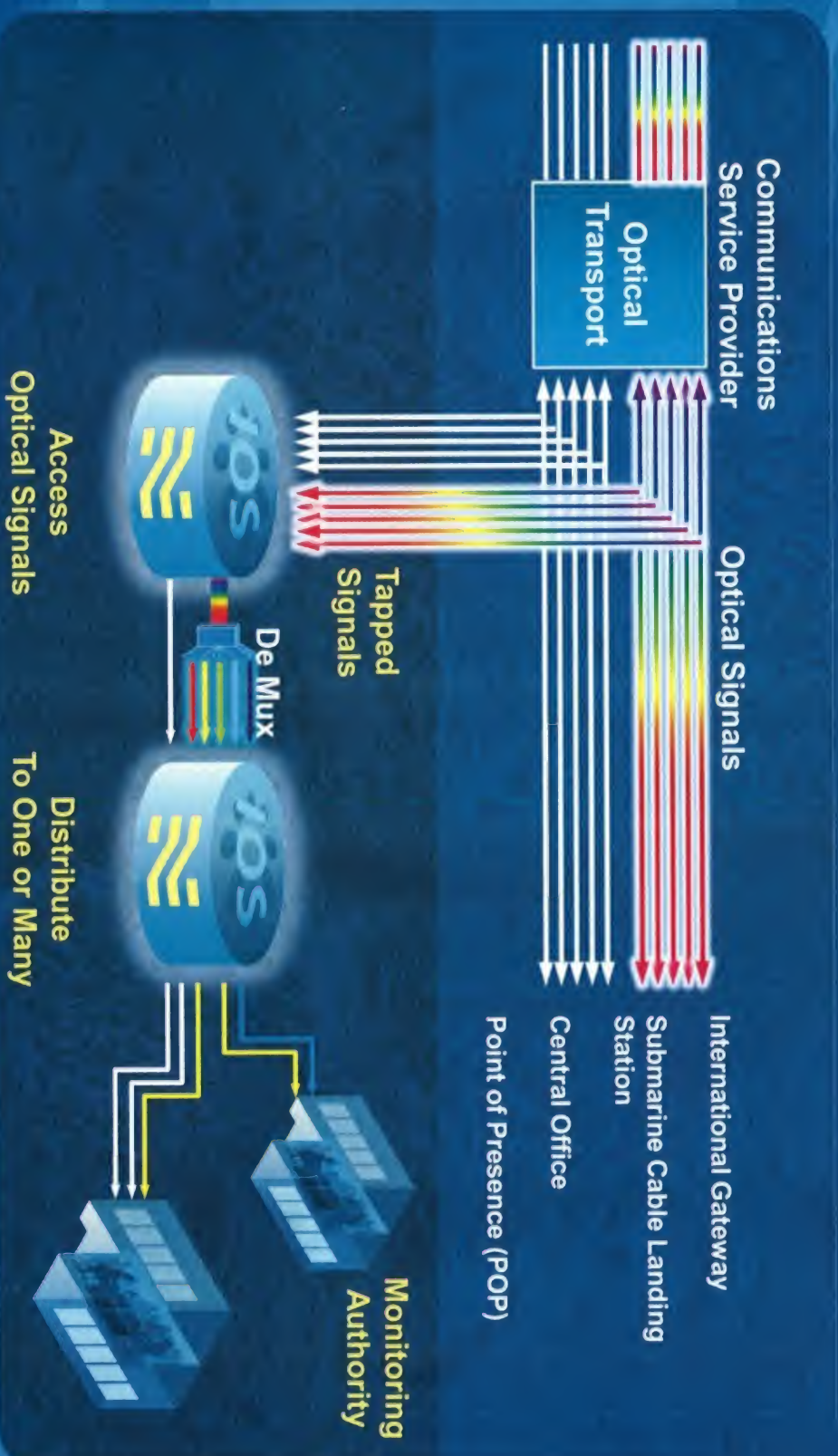
Glimmerglass
Optical Cyber Solutions

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Glimmerglass
Optical Cyber Solutions

INTELLIGENT OPTICAL SIGNAL SELECTION AND MONITORING

Create

Monitor

Reconfigure

The booming growth in optical signal transmission rates and number of protocols presents a challenge for organizations that must access and monitor signals in today's fiber optic networks. Communications Service Providers (CSPs), law enforcement agencies (LEAs), and intelligence agencies require flexible, cost-effective optical signal management solutions that can handle dense or broadly deployed topologies while economically scaling with network growth and protocol evolution. The Glimmerglass Intelligent Optical System (IOS) addresses these issues, allowing operators to rapidly and remotely access, monitor, and distribute optical signals for network monitoring.

The Challenge

As network traffic continues to increase exponentially, protocols evolve, and optical networks expand, new equipment and capabilities are required to access and monitor communications. In this environment, operators need a more flexible, scalable and cost-effective way to access and monitor their optical signals.

The Need for Intelligent Optical Signal Access and Monitoring

- **Efficiently access 10s, 100s or 1000s of optical signals / wavelengths without disrupting network traffic**
- **Select and distribute optical signals for processing and analysis on demand**
- **Flexibly handle any data rate, any protocol and any format including DWDM**
- **Centrally execute, track, and audit optical signal intercepts**
- **Maximize ROI of probes, processing and analysis equipment**

The Solution

Glimmerglass Intelligent Optical Systems integrate powerful software with cutting-edge hardware to provide unmatched flexibility, performance, and cost savings for optical signal access and monitoring. CSPs, LEAs, and intelligence agencies use the IOS to rapidly access target optical signals and distribute them to signal processing and monitoring equipment, all without disrupting network traffic.

IOS = Glimmerglass Intelligent Optical System
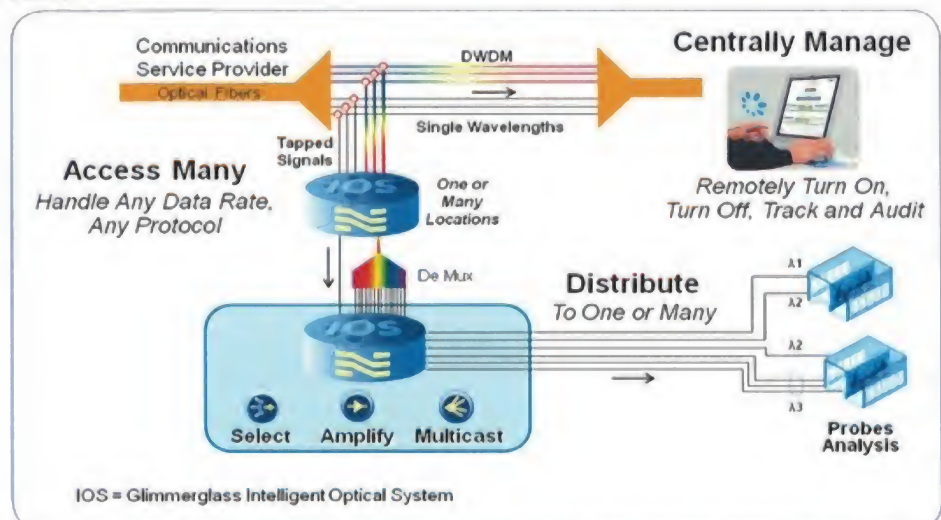
The Glimmerglass Intelligent Optical System allows operators to rapidly and remotely access signals, regardless of signal rate or protocol, and to make perfect photonic copies for distribution to monitoring authorities for processing and analysis.

www.glimmerglass.com

With Glimmerglass, CSPs are able to rapidly and efficiently access fiber assets throughout their network. Customers realize OPEX savings through the ability to rapidly and remotely select any signal, including DWDM, from hundreds to thousands of signals in the network. To cooperate with lawful interception requests, Service Providers can use the speed and flexibility of the IOS to select and deliver signals to Law Enforcement Agencies in real time. The IOS adds manageability to persistent, passive optical taps, enabling operators to send signals for analysis at anytime and to anywhere.

LEAs or intelligence agencies tasked with monitoring communications also benefit from the flexibility of the Glimmerglass Intelligent Optical System. With the IOS, the agency gains rapid access, not just to signals, but to individual wavelengths on those signals. An LEA operator can quickly and easily select any signal from hundreds, send that signal to a de-multiplexer for access to one of the many wavelengths inside, and then distribute the desired wavelengths as needed. The IOS can make perfect photonic copies of optical signals for simultaneous distribution to grooming equipment and probes for comprehensive analysis. This ability to multicast and distribute signals results in dramatic reduction of CAPEX by maximizing the ROI of probes through device sharing.

The Glimmerglass Intelligent Optical System is able to handle any data rate and any protocol, making it the ultimate flexible and scalable signal access and monitoring solution. The purely optical, photonic signal management employed by the IOS means that a system managing 10Gb/s data rates today can manage 100Gb/s data rates tomorrow without upgrade. This extreme flexibility comes in a low power, low form-factor product that consumes less than 85 watts of power and fits in just 4RU of rack space.

The Glimmerglass Benefits Summary

- More quickly and effectively execute and manage optical signal/IP link intercepts

- Deploy a scalable, and future-proof solution, compatible with all data rates, signal formats, probes and DPI equipment

- Centrally manage the execution, tracking and auditing of non-intrusive intercepts of any fiber asset

- Reduce OPEX with rapid, remote access to all optical signals/wavelengths

- Significantly reduce CAPEX by increasing utilization of monitoring equipment and reducing the number of probes, DPI and analysis devices required

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Glimmerglass
Optical Cyber Solutions

Glimmerglass Intelligent Optical Systems

Industry Leading Capabilities

- Industry's most compact / highest port density photonic cross-connect
- Bit rate independent - supports all optical data rates including 100 Gb/s
- Protocol and format independent; compatible with SONET/SDH, Ethernet, C/DWDM, Video, FC, FICON, ESCON, and all others
- Matrix size: 16x16 to 192x192 fiber ports
- Asymmetric configurations
- 20 millisecond switching
- Ultra-low power consumption: < 85 Watts
- Supports dark and very low power connections
- Single mode fiber, wideband (1270 nm - 1630 nm)

Easy to Manage and Use

- SNMPv3
- Web-based user interface
- Import and export topologies
- Command-Line Interface (TL1)

Powerful Carrier-Class Design

- Delivers 99.999+% availability
- In-service software upgrades

Outstanding Reliability

- MTBF > 30 years
- Dual -48V DC or redundant, hot-swappable AC power option

Advanced Optical Signal Management

- Optical power monitoring
- Threshold crossing alerts
- Protection switching rules
- Photonic multicasting for connecting point to multipoint
- Dedicated or switched Variable Optical Attenuation (VOA) to control output power levels
- Virtual Private Switch (VPS) allows administrators to partition ports for individual user access
- Bidirectional operation

System 600
32x32 - 192x192

System 100
16x16 - 96x96

System 500
32x32 - 192x192

Intelligent Optical Signal Management

Glimmerglass Intelligent Optical Systems revolutionize optical signal management by enabling network operators to rapidly and remotely access, distribute and monitor optical signals and create and reconfigure optical paths in real time. Advanced management software combined with purely optical, photonic cross-connects provide remote operators with superior visibility and control of optical signals.

Intelligent Optical Systems provide transparent signal access and are key enablers of the Glimmerglass CyberSweep™. Their unique capabilities enable the dynamic selection and distribution of optical signals for analysis and storage.

Glimmerglass optical systems enable operators to:
- Access and monitor optical signals in real time without disrupting traffic
- Remotely create and reconfigure optical signal paths in milliseconds
- Handle any data rate, any protocol and any format including DWDM
- Select, duplicate, and distribute optical signals to one or many locations
- Continuously monitor signals and remotely test and diagnose optical paths

Create

Glimmerglass systems provide a fully non-blocking, transparent cross-connect. In milliseconds an optical path can be created between any fiber input and output. Since the technology is fully transparent, the newly created optical path will transport any signal regardless of data format or speed.

Monitor

Continuous optical power monitoring combined with transparent switching forms a superior solution for remotely monitoring network paths and performing diagnostics. Loopback paths may be created in milliseconds to help isolate a fault to a particular piece of equipment.

Reconfigure

Glimmerglass systems are the ideal solution for remotely adding, reconfiguring, and disconnecting optical paths on demand and making system level topology changes.

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ClickFlow

Glimmerglass ClickFlow is an embedded, web-based management GUI that comes with every Intelligent Optical System. ClickFlow provides the user with at-a-glance monitoring of optical power levels and connection status as well as point-and-click provisioning of new connections. ClickFlow also provides access to real-time connection reports, connection and port configuration, user management, hardware alarms, and system configuration. ClickFlow is a secure environment that requires authentication.

SNMP

The embedded SNMP agent allows a SNMP manager to monitor, reconfigure, and manage a Glimmerglass Intelligent Optical System with SNMP Gets, Sets, and Trap functions. SNMP version 3 with compatibility to v2 and v1 is supported.

TL1 Command-Line Interface

Transaction Language 1 (TL1) is a management protocol defined in Bellcore Generic Requirements GR-831-CORE. The Glimmerglass Intelligent Optical System extends the TL1 language with a command set that enables command-line and programmatic operation and monitoring of the system.

Glimmerglass Console

The web-based Glimmerglass Console interface accesses the Glimmerglass Console Server application, which runs on an independent server that securely communicates with the switches and receives switch status and events via encrypted packets. The Glimmerglass Console Server provides the following general functions: Admistration of multiple Glimmerglass Intelligent Optical Systems and monitoring of events and user activities.

Markets Served

The ability to quickly create, monitor and reconfigure optical paths has made Glimmerglass Intelligent Optical Systems a mainstay in applications across a range of Cyber Security, Lawful Interception, Intelligence, and Telecom environments.

Cyber Security and Lawful Interception

Glimmerglass Intelligent Optical Systems enhance the Glimmerglass CyberSweep™ by enabling dynamic selection and distribution of signals for analysis and storage.

Intelligence and Defense

The world's elite intelligence agencies from the United States, Europe and Asia employ Glimmerglass Intelligent Optical Systems for enhanced monitoring of optical networks and distribution of mission-critical information.

Telecom Central Offices/POPs

International Service Providers use Glimmerglass Intelligent Optical Systems to gain visibility and control of their optical networks. With Glimmerglass, Service Providers gain enhanced monitoring and response to threats and failures.

Undersea Cable Landing Stations

Glimmerglass Intelligent Optical Systems improve network availability of undersea cables through enhanced monitoring and signal management.

Cyber Lab Automation

Glimmerglass Intelligent Optical Systems combine reliable, field-proven hardware with intuitive management software to create a dynamic optical fabric for lab environments.

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v4

Glimmerglass
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System 100
16x16 - 96x96

The Glimmerglass Intelligent Optical System 100

Industry Leading Capabilities

- Industry's most compact / highest port density photonic cross-connect
- Bit rate independent - supports all optical data rates including 100 Gb/s
- Protocol and format independent; compatible with SONET/SDH, Ethernet, C/DWDM, Video, FC, FICON, ESCON, and all others
- Matrix size: 16x16 to 96x96 fiber ports
- Asymmetric configurations
- 20 millisecond switching
- Ultra-low power consumption: < 50 Watts
- Supports dark and very low power connections
- Single mode fiber, wideband (1270 nm - 1630 nm)

Easy to Manage and Use

- SNMPv3
- Web-based user interface
- Import and export topologies
- Command-Line Interface (TL1)

Powerful Carrier-Class Design

- Delivers 99.999+% availability
- In-service software upgrades

Outstanding Reliability

- MTBF > 30 years
- Dual -48V DC or redundant, hot-swappable AC power option

Advanced Optical Signal Management

- Optical power monitoring
- Threshold crossing alerts
- Protection switching rules
- Photonic multicasting for connecting point to multipoint
- Dedicated or switched Variable Optical Attenuation (VOA) to control output power levels
- Virtual Private Switch (VPS) allows administrators to partition ports for individual user access
- Bidirectional operation

Intelligent Optical Signal Management

The Glimmerglass Intelligent Optical System 100 revolutionizes optical signal management by enabling network operators to rapidly and remotely access, distribute and monitor optical signals and create and reconfigure optical paths in real time. Advanced management software combined with purely optical, photonic cross-connects provide remote operators with superior visibility and control of optical signals.

Intelligent Optical Systems provide transparent signal access and are key enablers of the Glimmerglass CyberSweep™. Their unique capabilities enable the dynamic selection and distribution of optical signals for analysis and storage.

Glimmerglass optical systems enable operators to:

- Access and monitor optical signals in real time without disrupting traffic
- Remotely create and reconfigure optical signal paths in milliseconds
- Handle any data rate, any protocol and any format including DWDM
- Select, duplicate, and distribute optical signals to one or many locations
- Continuously monitor signals and remotely test and diagnose optical paths

Create

Glimmerglass systems provide a fully non-blocking, transparent cross-connect. In milliseconds an optical path can be created between any fiber input and output. Since the technology is fully transparent, the newly created optical path will transport any signal regardless of data format or speed.

Monitor

Continuous optical power monitoring combined with transparent switching forms a superior solution for remotely monitoring network paths and performing diagnostics. Loopback paths may be created in milliseconds to help isolate a fault to a particular piece of equipment.

Reconfigure

Glimmerglass systems are the ideal solution for remotely adding, reconfiguring, and disconnecting optical paths on demand and making system level topology changes.

www.glimmerglass.com

Mechanical / Electrical	System 100
Fiber Type	Single Mode Fiber
Individual Fiber Connectors	LC, FC, SC
High Density, Multi-Fiber Connectors	MTP-8, MTP-12
19" Chassis Rack Space (Rack Units)	2 RU
Chassis Dimensions: Height x Width x Depth	inch: 3.5 x 17.0 x 20.8 mm: 89 x 432 x 528
Weight. lbs / kgs	20.0 / 9.1
Power Options	Dual -48 VDC or 100-240 VAC 50/60 Hz
AC High Availability Power Supplies	Redundant, Hot Swappable (1RU)
Power Consumption (DC)	<50W
Certified Compliance	UL, CSA, CE, FCC Class A, RoHS 5/6
Control Interface	RJ45 Ethernet 10/100 BASE-T
Craft Interface	RS-232 (DB9) and RJ45 Ethernet 10/100 BASE-T
Control/Craft Protocol	TL1, SNMPv3, HTML

Front

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Optical	Unit	Min	Typical[1]	Max[1]
Ports (Fiber Inputs x Fiber Outputs)[2] MTP-8 Connectors MTP-12 Connectors LC Connectors FC Connectors SC Connector	fibers	32 (16 x 16) 32 (16 x 16) 32 (16 x 16) 32 (16 x 16) 32 (16 x 16)		192 (96 x 96) 192 (96 x 96) 96 (48 x 48) 48 (24 x 24) 48 (24 x 24)
Insertion Loss (1 to 1 connections)[1,3]	dB		1.7	2.7
Insertion Loss (Multicasting, 1 to N connections)[1,3]	dB		1:2 | 1:4 | 1:6 | 1:8 8 | 11 | 14 | 15	1:2 | 1:4 | 1:6 | 1:8 9 | 12 | 15 | 16
Wavelength Range	nm	1270		1630
Loss Repeatability	dB		+/- 0.05	+/- 0.10
Spectral Variation (O, C, or L band)	dB			0.50
Polarization Dependent Loss	dB		0.05	0.10
Polarization Mode Dispersion	ps/nm		0.005	0.010
Optical Return Loss[1]	dB	30	35	
Crosstalk	dB			-70
Switching Speed	ms		20	
Input Optical Power[4]	dBm	-25		+20
Operating Temperature	°C	-5		+50
Operating Humidity (Non-condensing)		5%		85%

[1] Measurements with LC, taken at 1310 nm and 1550 nm at 25 °C. [2] Asymmetric configurations (NxM) are available. [3] Measured input fiber to output fiber, dependent upon hardware configuration. [4] Standard configuration. Low power option: -35 to +15dBm.

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Optical Cyber Solutions

The Glimmerglass Intelligent Optical System 500

Industry Leading Capabilities

- Industry's most compact / highest port density photonic cross-connect
- Bit rate independent - supports all optical data rates including 100 Gb/s
- Protocol and format independent; compatible with SONET/SDH, Ethernet, C/DWDM, Video, FC, FICON, ESCON, and all others
- Matrix size: 32x32 to 192x192 fiber ports
- Asymmetric configurations
- 20 millisecond switching
- Ultra-low power consumption: < 85 Watts
- Supports dark and very low power connections
- Single mode fiber, wideband (1270 nm - 1630 nm)

Easy to Manage and Use

- SNMPv3
- Web-based user interface
- Import and export topologies
- Command-Line Interface (TL1)

Powerful Carrier-Class Design

- Delivers 99.999+% availability
- In-service software upgrades

Outstanding Reliability

- MTBF > 30 years
- Dual -48V DC or redundant, hot-swappable AC power option

Advanced Optical Signal Management

- Optical power monitoring
- Threshold crossing alerts
- Protection switching rules
- Photonic multicasting for connecting point to multipoint
- Dedicated or switched Variable Optical Attenuation (VOA) to control output power levels
- Virtual Private Switch (VPS) allows administrators to partition ports for individual user access
- Bidirectional operation

System 500
32x32 - 192x192

Intelligent Optical Signal Management

The Glimmerglass Intelligent Optical System 500 revolutionizes optical signal management by enabling network operators to rapidly and remotely access, distribute and monitor optical signals and create and reconfigure optical paths in real time. Advanced management software combined with purely optical, photonic cross-connects provide remote operators with superior visibility and control of optical signals.

Intelligent Optical Systems provide transparent signal access and are key enablers of the Glimmerglass CyberSweep™. Their unique capabilities enable the dynamic selection and distribution of optical signals for analysis and storage.

Glimmerglass optical systems enable operators to:
- Access and monitor optical signals in real time without disrupting traffic
- Remotely create and reconfigure optical signal paths in milliseconds
- Handle any data rate, any protocol and any format including DWDM
- Select, duplicate, and distribute optical signals to one or many locations
- Continuously monitor signals and remotely test and diagnose optical paths

Create

Glimmerglass systems provide a fully non-blocking, transparent cross-connect. In milliseconds an optical path can be created between any fiber input and output. Since the technology is fully transparent, the newly created optical path will transport any signal regardless of data format or speed.
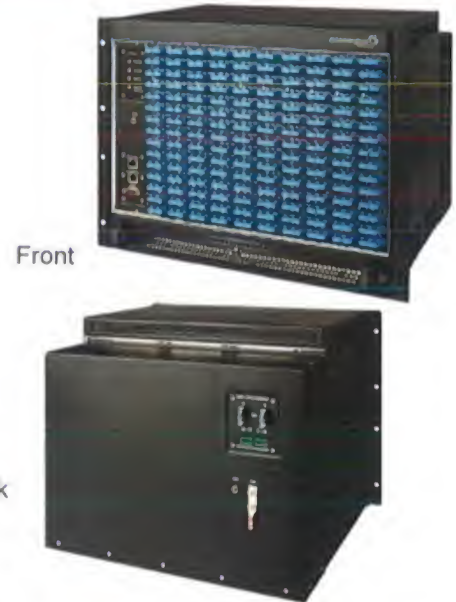
Monitor

Continuous optical power monitoring combined with transparent switching forms a superior solution for remotely monitoring network paths and performing diagnostics. Loopback paths may be created in milliseconds to help isolate a fault to a particular piece of equipment.

Reconfigure

Glimmerglass systems are the ideal solution for remotely adding, reconfiguring, and disconnecting optical paths on demand and making system level topology changes.

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INTELLIGENT OPTICAL SYSTEM 500

Mechanical / Electrical	System 500
Fiber Type	Single Mode Fiber
Individual Fiber Connectors	LC, FC, SC
High Density, Multi-Fiber Connectors	MTP-8, MTP-12
19" Chassis Rack Space (Rack Units)	8 RU
Chassis Dimensions: Height x Width x Depth	inch: 14.0 x 17.2 x 16.1 mm: 356 x 437 x 410
Weight: lbs / kgs	38.0 / 17.2
Power Options	Dual -48 VDC or 100-240 VAC 50/60 Hz
AC High Availability Power Supplies	Redundant, Hot Swappable (1RU)
Power Consumption (DC)	<85W
Certified Compliance	UL, CSA, CE, FCC Class A, RoHS 5/6
Control Interface	RJ45 Ethernet 10/100 BASE-T
Craft Interface	RS-232 (DB9) and RJ45 Ethernet 10/100 BASE-T
Control/Craft Protocol	TL1, SNMPv3, HTML

Front

Back

Optical	Unit	Min	Typical[1]	Max[1]
Ports (Fiber Inputs x Fiber Outputs)[2] MTP-8 Connectors MTP-12 Connectors LC Connectors FC Connectors SC Connector	fibers	64 (32 x 32) 72 (36 x 36) 64 (32 x 32) 64 (32 x 32) 64 (32 x 32)		384 (192 x 192) 384 (192 x 192) 384 (192 x 192) 144 (72 x 72) 300 (150 x 150)
Insertion Loss (1 to 1 connections)[1][3]	dB		1.7	3.7 [5]
Insertion Loss (Multicasting, 1 to N connections)[1][3]	dB		1:2 | 1:4 | 1:6 | 1:8 8 | 11 | 14 | 15	1:2 | 1:4 | 1:6 | 1:8 [5] 11 | 14 | 17 | 18
Wavelength Range	nm	1270		1630
Loss Repeatability	dB		+/- 0.05	+/- 0.10
Spectral Variation (O, C, or L band)	dB			0.50
Polarization Dependent Loss	dB		0.05	0.10
Polarization Mode Dispersion	ps/nm		0.005	0.010
Optical Return Loss[1]	dB	30	35	
Crosstalk	dB			-70
Switching Speed	ms		20	
Input Optical Power[4]	dBm	-25		+20
Operating Temperature	°C	-5		+50
Operating Humidity (Non-condensing)		5%		85%

[1] Measurements with LC, taken at 1310 nm and 1550 nm at 25 °C. [2] Asymmetric configurations (NxM) are available. [3] Measured input fiber to output fiber, dependent upon hardware configuration. [4] Standard configuration. Low power option: -35 to +15dBm. [5] >96 x 96 ports.

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INTELLIGENT OPTICAL SYSTEM 600

The Glimmerglass Intelligent Optical System 600

Industry Leading Capabilities

- Industry's most compact / highest port density photonic cross-connect
- Bit rate independent - supports all optical data rates including 100 Gb/s
- Protocol and format independent; compatible with SONET/SDH, Ethernet, C/DWDM, Video, FC, FICON, ESCON, and all others
- Matrix size: 32x32 to 192x192 fiber ports
- Asymmetric configurations
- 20 millisecond switching
- Ultra-low power consumption: < 85 Watts
- Supports dark and very low power connections
- Single mode fiber, wideband (1270 nm - 1630 nm)

Easy to Manage and Use

- SNMPv3
- Web-based user interface
- Import and export topologies
- Command-Line Interface (TL1)

Powerful Carrier-Class Design

- Delivers 99.999+% availability
- In-service software upgrades

Outstanding Reliability

- MTBF > 30 years
- Dual -48V DC or redundant, hot-swappable AC power option

Advanced Optical Signal Management

- Optical power monitoring
- Threshold crossing alerts
- Protection switching rules
- Photonic multicasting for connecting point to multipoint
- Dedicated or switched Variable Optical Attenuation (VOA) to control output power levels
- Virtual Private Switch (VPS) allows administrators to partition ports for individual user access
- Bidirectional operation

System 600
32x32 - 192x192

Intelligent Optical Signal Management

The Glimmerglass Intelligent Optical System 600 revolutionizes optical signal management by enabling network operators to rapidly and remotely access, distribute and monitor optical signals and create and reconfigure optical paths in real time. Advanced management software combined with purely optical, photonic cross-connects provide remote operators with superior visibility and control of optical signals.

Intelligent Optical Systems provide transparent signal access and are key enablers of the Glimmerglass CyberSweep™. Their unique capabilities enable the dynamic selection and distribution of optical signals for analysis and storage.

Glimmerglass optical systems enable operators to:

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- Remotely create and reconfigure optical signal paths in milliseconds
- Handle any data rate, any protocol and any format including DWDM
- Select, duplicate, and distribute optical signals to one or many locations
- Continuously monitor signals and remotely test and diagnose optical paths

Create

Glimmerglass systems provide a fully non-blocking, transparent cross-connect. In milliseconds an optical path can be created between any fiber input and output. Since the technology is fully transparent, the newly created optical path will transport any signal regardless of data format or speed.

Monitor

Continuous optical power monitoring combined with transparent switching forms a superior solution for remotely monitoring network paths and performing diagnostics. Loopback paths may be created in milliseconds to help isolate a fault to a particular piece of equipment.

Reconfigure

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www.glimmerglass.com

INTELLIGENT OPTICAL SYSTEM 600

Mechanical / Electrical	System 600
Fiber Type	Single Mode Fiber
Individual Fiber Connectors	LC, FC, SC
High Density, Multi-Fiber Connectors	MTP-8, MTP-12
19" Chassis Rack Space (Rack Units)	4 RU
Chassis Dimensions: Height x Width x Depth	inch: 7.0 x 16.6 x 27.8 mm: 178 x 437 x 706
Weight: lbs / kgs	38.0 / 17.2
Power Options	Dual -48 VDC or 100-240 VAC 50/60 Hz
AC High Availability Power Supplies	Redundant, Hot Swappable (1RU)
Power Consumption (DC)	<85W
Certified Compliance	UL, CSA, CE, FCC Class A, RoHS 5/6
Control Interface	RJ45 Ethernet 10/100 BASE-T
Craft Interface	RS-232 (DB9) and RJ45 Ethernet 10/100 BASE-T
Control/Craft Protocol	TL1, SNMPv3, HTML

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Wavelength Range	nm	1270		1630
Loss Repeatability	dB		+/- 0.05	+/- 0.10
Spectral Variation (O, C, or L band)	dB			0.50
Polarization Dependent Loss	dB		0.05	0.10
Polarization Mode Dispersion	ps/nm		0.005	0.010
Optical Return Loss[1]	dB	30	35	
Crosstalk	dB			-70
Switching Speed	ms		20	
Input Optical Power[4]	dBm	-25		+20
Operating Temperature	°C	-5		+50
Operating Humidity (Non-condensing)		5%		85%

[1] Measurements with LC, taken at 1310 nm and 1550 nm at 25 °C. [2] Asymmetric configurations (NxM) are available. [3] Measured input fiber to output fiber, dependent upon hardware configuration. [4] Standard configuration. Low power option: -35 to +15dBm. [5] >96 x 96 ports.

Glimmerglass
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INTELLIGENT PERIPHERAL SYSTEM 3000

The IPS 3000 is a flexible and robust platform for managing optical modules

Features

- Central management of optical networking modules
- Compact: Supports 12 peripheral modules in a single 6 rack unit (RU) chassis
- Power consumption: 100W max
- ETSI 300 (12") depth form factor
- Integral fiber management

Easy to Install, Program and Use

- Hot-swappable Peripheral Modules can be mixed and matched as needed
- SNMPv3 for control and management
- Command-Line Interface (TL1) for control and management
- ClickManage - a built-in user-friendly web GUI
- Alarm management
- Inventory reporting
- SSL encrypted access

Outstanding Reliability and Performance

- Dual -48V DC or redundant, hot-swappable AC power
- Hot-swappable modules
- Hot-swappable fan tray
- Front to back airflow
- Alarm contacts

Control and Monitoring for All Modules

- Alarm triggers and configurable optical power thresholds
- Constant gain and output power modes for amplifiers

Compliances

- FCC Part 15 Class A, UL 60950-1, CSA, CE, RoHS 6/6
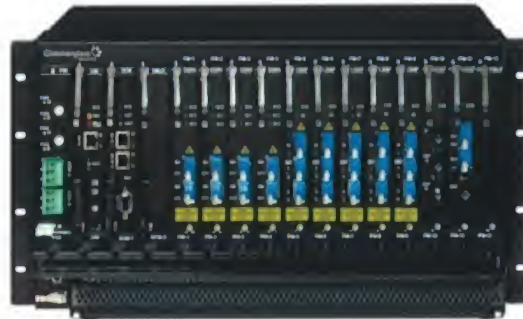
IPS 3000

Peripheral Module

Centralized Optical Peripheral Management

The Glimmerglass Intelligent Peripheral System 3000 (IPS 3000) is a carrier-grade platform that provides centralized management of various optical networking modules. The 6RU shelf offers tremendous service density while providing system flexibility. Up to 12 Peripheral Modules may be mixed and matched in a single chassis as required. The IPS 3000 can be controlled via SNMPv3, Command-Line Interface (TL1), or the built-in ClickManage GUI.

In addition to operating as a standalone system, the IPS 3000 can be combined with Glimmerglass Intelligent Optical Systems to form a flexible optical signal management solution. Together, the systems are key enablers of the Glimmerglass CyberSweep™. Their unique capabilities enable the dynamic selection and distribution of optical signals for analysis and storage.

Flexible

The IPS 3000 supports a variety of hot-swappable modules that can be mixed and matched to address a broad range of networking needs.

- **Dual Optical Power Amplifier Modules** contain two independent EDFAs per module. A Dual Optical Power Amplifier Module occupies one slot in the chassis, allowing up to 24 amplifiers in a single 6RU IPS 3000.

- **Lossless Splitter Modules** combine a single 1:N (N≤12) optical splitter with an associated optical amplifier to compensate for loss. Each Lossless Splitter Module occupies one slot in the chassis, allowing up to 12 lossless splitters in a single 6RU IPS 3000.

- **High Density Splitter Modules** provide the highest splitter density in the industry. High Density Splitter Modules come in various configurations from twelve 1:2 splitters to a single 1:16 splitter on a one slot card. With 12 High Density Splitter Modules, the IPS 3000 can support up to 144 1:2 splitters or 12 1:16 splitters in a single 6RU chassis.

IPS 3000 Chassis and System Control Module (SCM)

The Intelligent Peripheral System 3000 chassis comes standard with a System Control Module (SCM). Together they provide management, monitoring, power, and cooling for all IPS 3000 peripheral modules.

System Control Module Features

- Access via SNMPv3, Command-Line Interface (TL1), or ClickManage GUI
- Configuration and control of peripheral modules
- System configuration and management
- System maintenance operations
- User session administration

Chassis Features

- Telecom grade alarms with dry contact relays
- Hot-swappable fan tray
- Front access
- Front to back airflow
- RoHS 6/6

Compliances	FCC Part 15 Class A, UL 60950-1, CSA, CE, RoHS 6/6
Physical Dimensions	
Chassis Dimensions: Height x Width x Depth	inch: 10.5 x 19 x 11.8 mm: 266.5 x 483 x 300
User Slots	12 Peripheral Modules
Weight Max. lbs / kgs	55.0 / 25.0
Electrical Specifications	
Supply Voltage	Dual -48V DC (Redundant AC optional)
Power Max	< 100W Fully Loaded
Environmental Specifications	
Operating Temperature	5°C to 50°C
Storage Temperature	-40°C to 85°C
Relative Humidity	5% to 95% non-condensing
Control/Craft Protocol	TL1, SNMPv3, HTML

IPS 3000 Peripheral Modules[1]

The IPS 3000 allows up to twelve peripheral modules to be mixed and matched in a single chassis. Available modules include:

Dual Optical Power Amplifier (DOPA) Module

The IPS 3000 DOPA module contains two independent EDFAs (1530 - 1560 nm). Each module occupies one slot in the IPS 3000 chassis, allowing up to 24 amplifiers to be supported in 6RU.

- Constant Gain and Constant Output Power mode
- Hot-swappable

- Pre-amp configurations
  - Input power : -30dBm to -6dBm, Gain 10dB to 25dB
- Booster amp configurations
  - Input power : -15dBm to 5dBm, Gain 5dB to 15dB

DOPA

### Lossless Splitter (LSSP) Module

The IPS 3000 LSSP module combines a single 1:N (N≤12) optical splitter with an associated EDFA (1530 - 1560 nm) to compensate for loss. Each module occupies one slot in the IPS 3000 chassis, allowing up to 12 lossless splitters to be supported in 6RU.

- Optical splits available from 1:2 to 1:12
- Constant Gain and Constant Output Power modes

- 90/10 and 80/20 split ratios available
- Hot-swappable

LSSP

High Density Splitter (HDSP) Module

The IPS 3000 HDSP modules provide the highest splitter density in the industry. Six configurations are available, each occupying one slot in the IPS 3000 chassis. The IPS 3000 can fit up to 144 1:2 splitters in 6RU.

- High Density, twelve 1:2 splitters in a one-slot card
- Hot-swappable

- Optical splits available from 1:2 to 1:16
- 90/10 and 80/20 split ratios available
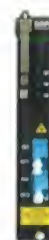
HDSP

1 For complete specification see individual Module Data Sheets.

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Glimmerglass
Optical Cyber Solutions

Glimmerglass Management Software simplifies setup, monitoring, and operations

Manage Remotely

- Supports SNMPv3 and Command-Line Interface (TL1)
- Robust Graphical User Interface (GUI) for all systems
- Centralized user administration for multiple systems
- Centralized logging of events
- Centralized system configuration and management
- Secure communications using Secure Sockets Layer (SSL)
- Set user privileges on a port-by-port basis
- Bidirectional operation

Control the Optical Layer

- Create optical paths via an intuitive, point-and-click GUI
- View and set rules and parameters for automatic switching on loss of light
- Easily configure and connect to shared system resources such as Variable Optical Attenuators (VOA) and Photonic Multicast Units
- Easily import and export topologies for rapid, system-wide reconfiguration

Monitor Connections With Ease

- At-a-glance status of each port via GUI
- Set power thresholds for color-coded, at-a-glance monitoring of power level on each connection
- Generate reports that are accurate to the second
- Name connections as well as ports for reference and logging

Intelligent Optical Signal Management Solutions

Glimmerglass provides a comprehensive suite of software tools to facilitate the setup, management, and monitoring of its family of Intelligent Optical Systems. Combined with the Systems' ability to rapidly and remotely create, monitor, and reconfigure optical paths in 20 milliseconds regardless of signal rate or protocol, this software provides network operators with unparalleled control of the optical layer.

Software Intelligence

With Glimmerglass software and Intelligent Optical Systems, the optical layer becomes a dynamic and flexible optical signal distribution system, capable of creating and reconfiguring optical paths in milliseconds.

Glimmerglass software is designed to address a broad range of customer needs. Whether it is a telecom service provider using Glimmerglass to improve network availability, or a government agency using Glimmerglass to select optical signals for rapid and secure distribution to end users or facilities, the advanced software has the depth and flexibility to seamlessly handle the task.

www.glimmerglass.com

ClickFlow

The Glimmerglass ClickFlow GUI supports a secure environment with authentication to manage fiber connections, device configurations, topologies and system reports. It provides real-time status reports of all ports and connections, as well as general information about the system and configuration.

SNMP

The embedded SNMP agent allows a SNMP manager to monitor, reconfigure, and manage a Glimmerglass Intelligent Optical System with SNMP Gets, Sets, and Trap functions. SNMP version 3 with compatibility to v2 and v1 is supported.

TL1 Command-Line Interface

Transaction Language 1 (TL1) is a management protocol defined in Bellcore Generic Requirements GR-831-CORE. The Glimmerglass Intelligent Optical System extends the TL1 language with a command set that enables command-line and programmatic operation and monitoring of the system.

Glimmerglass Console

Glimmerglass Console (GGC) resides on an independent server and provides web-based, secure communication to multiple Glimmerglass Intelligent Optical Systems. GGC provides a GUI for the centralized monitoring of status and events for all systems.

Users are granted password protected access to the GGC based on their pre-defined role and access privileges, which provides them with a secure client login from anywhere in the world. The Glimmerglass Console Server provides the following general functions:

- Centralized configuration
- Centralized hardware alarm monitoring
- Centralized logging and viewing of events
- Forwarding of Events and SNMP Traps
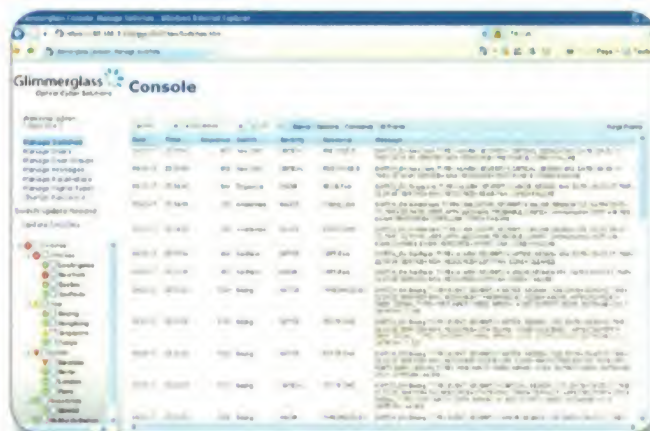
Physical Interfaces

Control Interface   RJ45 Ethernet 10/100 Base-T

Craft Interface   RJ45 Ethernet 10/100 Base-T and RS 232 (DB9)

Protocols

SNMPv3, TL1, HTML, Syslog

Security

Secure Sockets Layer (SSL)

Web browsers

Microsoft Internet Explorer version 7 or 8

Mozilla Firefox version 2 or 3

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